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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,490	07/09/2003	Thomas Hubert Van Steenkiste	DP-306711CIP1	9723
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DELPHI TECHNOLOGIES, INC. M/C 480-410-202 PO BOX 5052 TROY, MI 48007				
			EXAMINER BAREFORD, KATHERINE A	
			ART UNIT 1762	PAPER NUMBER

DATE MAILED: 02/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/616,490

Applicant(s)

STEENKISTE ET AL.

Examiner

Katherine A. Bareford

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7/9/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-18, drawn to a method, classified in class 427, subclass 446.

II. Claim 19, drawn to a product, classified in class 428, subclass 544+.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by another and materially different process, such as plasma spraying.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Mr. McBain on Jan. 5, 2005 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-18. Affirmation of this election must be made by applicant in replying to this Office action. Claim 19 is withdrawn from

further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

#### *Specification*

6. The disclosure is objected to because of the following informalities: at paragraph [0001] applicant indicates that this application is "a continuation-in-part of U.S. Application No. 10/252,203, filed September 23, 2002.". However, the application papers indicate that this application is actually a CIP of 10/417,495, which is a continuation of 10/252,203.

Appropriate correction is required.

#### *Claim Objections*

7. Claims 1, 6, 16 and 17 are objected to because of the following informalities: (1) in claim 1, lines 12, and 13, it should be clarified that the referred to particles are "the first population of particles" and at line 18, that the referred to particles are "the second population of particles". (2) in claim 6, line 2, "the main gas" lacks antecedent basis. Does applicant simply mean "the gas"?

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(3) in claim 16, line 2, "a nozzle" and "a diverging region" should be "the nozzle" and "the diverging region", respectively, to provide proper antecedent basis back to claim 1. (4) in claim 17, line 2, "a nozzle" and "a throat" should be "the nozzle" and "the throat", respectively, to provide proper antecedent basis back to claim 1.

Appropriate correction is required.

*Claim Rejections - 35 USC § 103*

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1-7 and 9-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Longo et al (US 3723165) in view of Browning (US 4416421).

Longo teaches a method of coating a substrate. Column 1, lines 45-60. The steps include providing at least a first population of particles (the polymer) and a second population of particles (the metal) to be sprayed. column 1, lines 45-60. A conventional flame spray device is

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provided to thermally spray the particles on to a substrate. Column 3, lines 10-25. The first and second populations are provided as a mixture and injected into the spray nozzle of the thermal spray gun at the same time to spray the particles. Column 4, line 50 through column 5, line 10. The temperature of the gas in the nozzle is such as to be insufficient to heat the first population of particles (the polymer) to a temperature at or above their melting temperature in the nozzle. Column 3, lines 10-40 (note heat softened rather than melted). The velocity of the particles, however, is sufficient to result in adherence of the particles on a substrate opposite the nozzle, in combination with the spraying of the second, metal, particles. Column 1, lines 45-60. The temperature of the gas in the nozzle is selected to be sufficient to heat the second population of particles (the metal) to a temperature above their melting point in the nozzle, thereby melting the second population of particles. Column 3, lines 10-40. The molten particles are accelerated to a velocity sufficient to result in adherence of the particles to the substrate. Column 1, lines 45-60. This forms a coating on the substrate that is a combination of the first and second populations of particles. Column 4, lines 30-50.

Claims 2 and 3: the diameter of the particles can be between 50 and 250 microns or 106 to 250 microns (the polymer and metal can be 100 mesh to 3 microns – 150 microns to 3 microns). Column 3, lines 10-15 and 30-40.

Claim 4: the particles can differ from one another in size and material composition. Column 1, lines 45-60 and column 2, lines 40-45.

Claim 5: Longo teaches that spray gas can include argon. Column 5, lines 1-5.

Claim 6 and 10-12: the temperature of the gas is such that the metal melts and the polymer is heat softened. Column 3, lines 10-40.

Claim 13: the substrate can be metal, an alloy, ceramic, or plastic. Column 3, lines 50-65.

Claim 14: the particles can be a metal and a polymer mixture, giving a first population of polymer and a second population of metal. Column 1, lines 45-60.

Claim 18: a mixture of the first and second populations of particles is supplied to the spray gun. Column 2, lines 30-35.

Longo teaches all the features of these claims except (1) the converging-diverging gun features (claim 1), (2) the specific gas/heating temperatures (claims 6, 10-12), (3) the injection point (claim 7), (4) the particle speed (claim 9), (5) the tube diameter (claim 15), (6) the nozzle diverging length (claim 16) and (7) the nozzle throat diameter (claim 17).

Browning teaches a flame spray system. Column 1, lines 10-20. In the system, a nozzle is provided having a throat located between a converging region and diverging region. Figure 1 and column 4, lines 25-45. A flow of gas is directed through the nozzle. Figure 1 and column 4, lines 25-45. The gas is maintained at a select temperature. Column 2, lines 20-35 (the continuous combustion provides controlled temperature based on the oxy-fuel mix used). The particles to be sprayed are injected into the nozzle and entrained in the flow of gas. Figure 1 and column 4, lines 25-45. A supersonic velocity of particles is achieved. Column 5, lines 15-30. The injection point is into the converging region of the nozzle prior to the throat. Figure 1 and column 4, lines 25-45. The particle speed can be 2000 ft/sec (approximately 610 m/sec).

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Column 5, lines 15-30. The nozzle length can be 4 inches (approximately 100 mm). Column 4, lines 45-55. The gas can include oxygen. Column 3, lines 50-60. The system is adjusted so that the length of the nozzle is at least five times that of the minimum diameter of the nozzle bore. Column 2, lines 40-50.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Longo to use the flame spray gun of Browning with an expectation of providing a desirable coating product, because Longo teaches a method of spraying mixtures of particles using a conventional flame spray system and Browning teaches a desirable flame spray system for spraying particles. Using the system of Browning provides the claimed converging-diverging gun features, the injection point, and the particle speed. As to the claimed specific gas/heating temperatures, Longo teaches that they must be such so as to provide the claimed heat softening/melting results, and one of ordinary skill in the art would perform routine experimentation to optimize the specific temperatures to be used based on the specific materials to be sprayed. As to the claimed tube diameters, nozzle lengths and throat diameters, Browning indicates that the system is to be adjusted so that the length of the nozzle is at least five times that of the minimum diameter of the nozzle bore, and as a result, one of ordinary skill in the art would perform routine experimentation to optimize the specific gun measurements based on the size of gun desired and material being sprayed.



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11. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Longo in view of Browning as applied to claims 1-7 and 9-18 above, and further in view of Browning (US 5531590) (hereinafter Browning '590).

Longo in view of Browning teaches all the features of these claims except injecting the particles into the diverging region of the nozzle after the throat.

However, Browning '590 teaches that when using a supersonic flame jet device, with a diverging region of the nozzle after a relatively narrow passage to introduce fuel and oxygen, it is known to inject the particles to be sprayed into the diverging region of the nozzle. See figure 2a and column 2, lines 5-30 and column 2, line 60 through column 3, line 15.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Longo in view of Browning to inject the particles into the diverging region as suggested by Browning '590 with an expectation of providing a desirable coating product, because Longo in view of Browning teaches a method of spraying mixtures of particles using a converging-diverging flame spray system and Browning '590 teaches a desirable flame spray system with a diverging region can be provided with a particle injection into the diverging region.

12. Bird (US 4938991) also teaches thermal spraying a mixture of particles, such that one set melts and the other does not. See column 3, lines 1-20.

*Oath/Declaration*

13. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

The oath states that "This application is a Continuation-In-Part of prior application Serial No. 10/252,203 filed September 23, 2002 which is a Continuation of U.S. Serial No. 10/252,203 filed September 23, 2002."

This is defective because the same serial number is referred to twice, once as a continuation and once as a CIP. Apparently the CIP serial number should be 10/417,495, filed April 17, 2003, from the information in the transmittal papers.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:30-4:00) with the First Friday Off.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck can be reached on (571) 272-1415. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.

Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for

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unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
KATHERINE BAREFORD  
PRIMARY EXAMINER